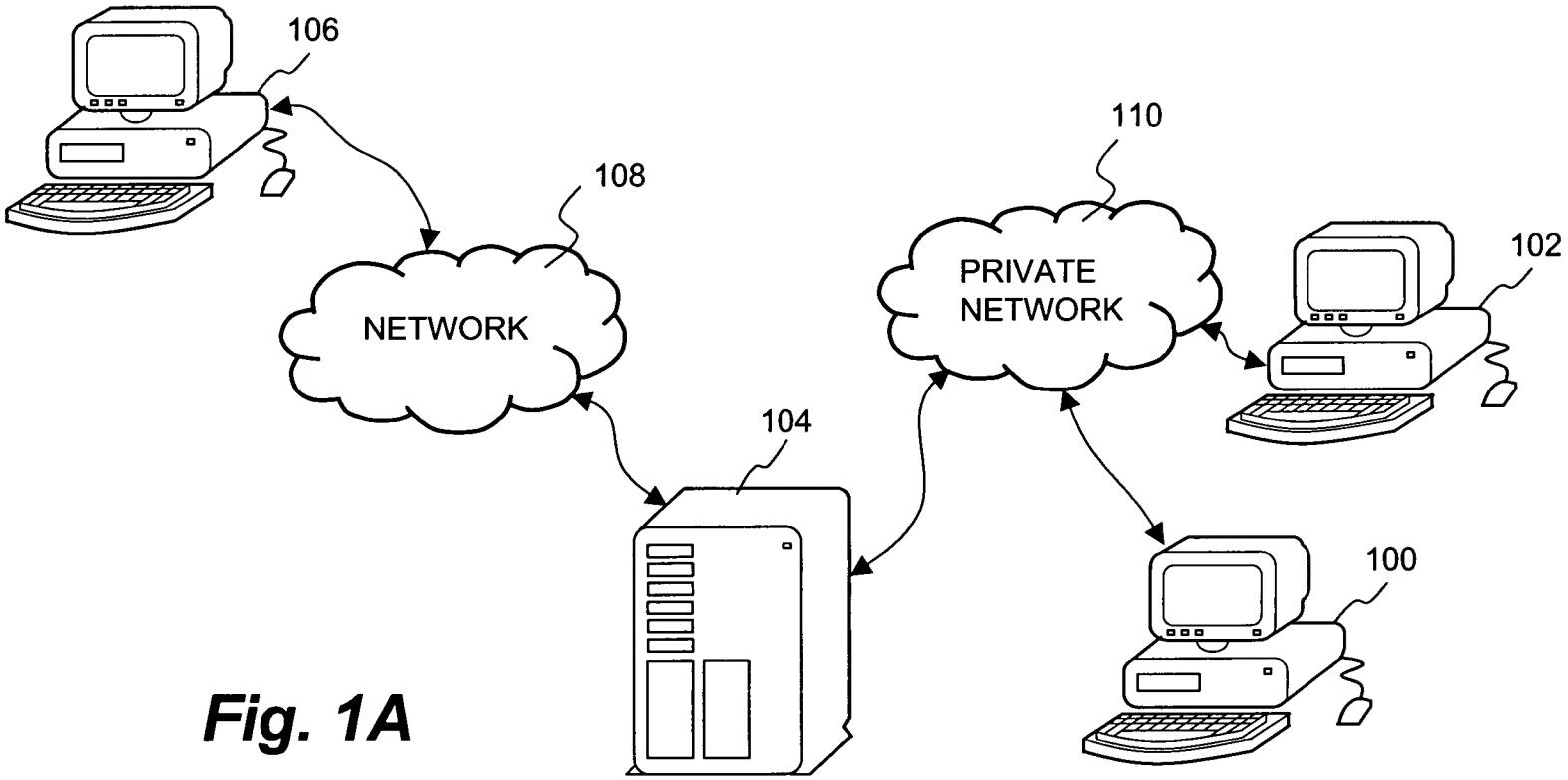


Fig. 1A

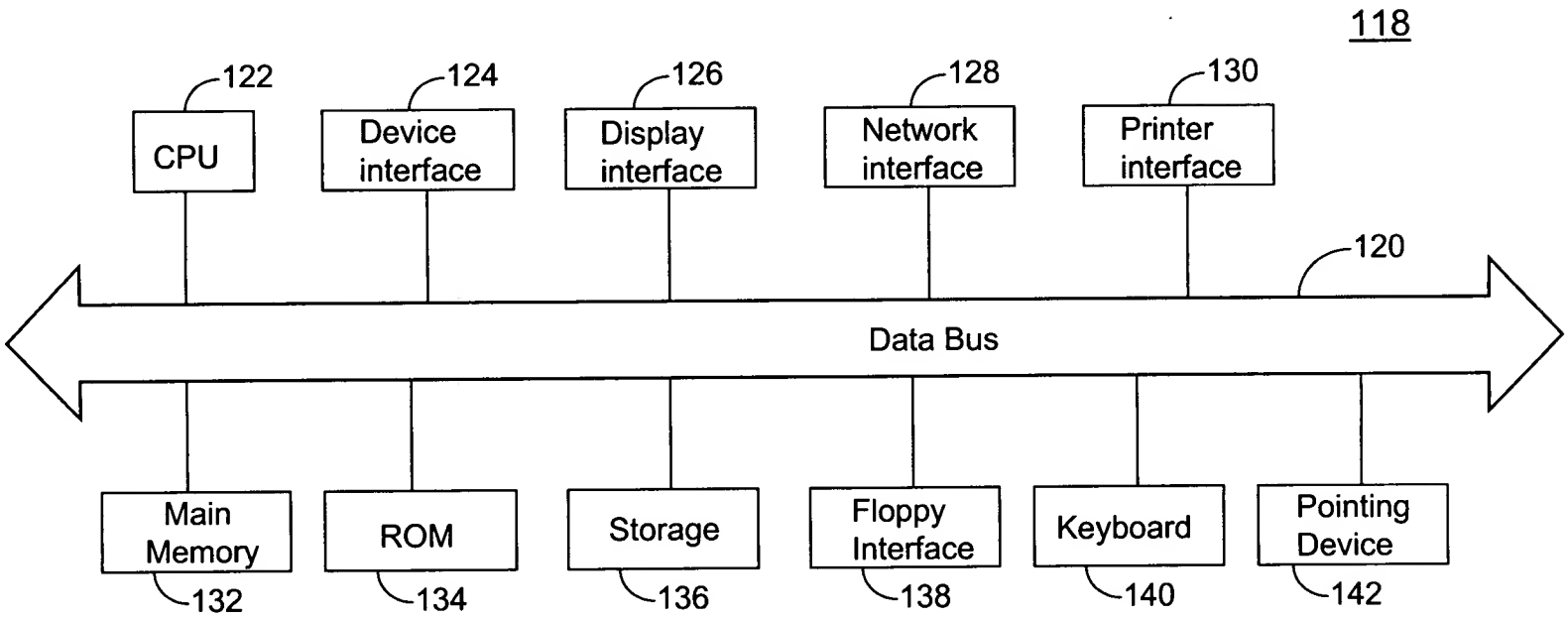

118
122
CPU
124
Device interface
126
Display interface
128
Network interface
130
Printer interface
120
Data Bus
Main Memory
132
ROM
134
Storage
136
Floppy Interface
138
Keyboard
140
Pointing Device
142

Fig. 1B

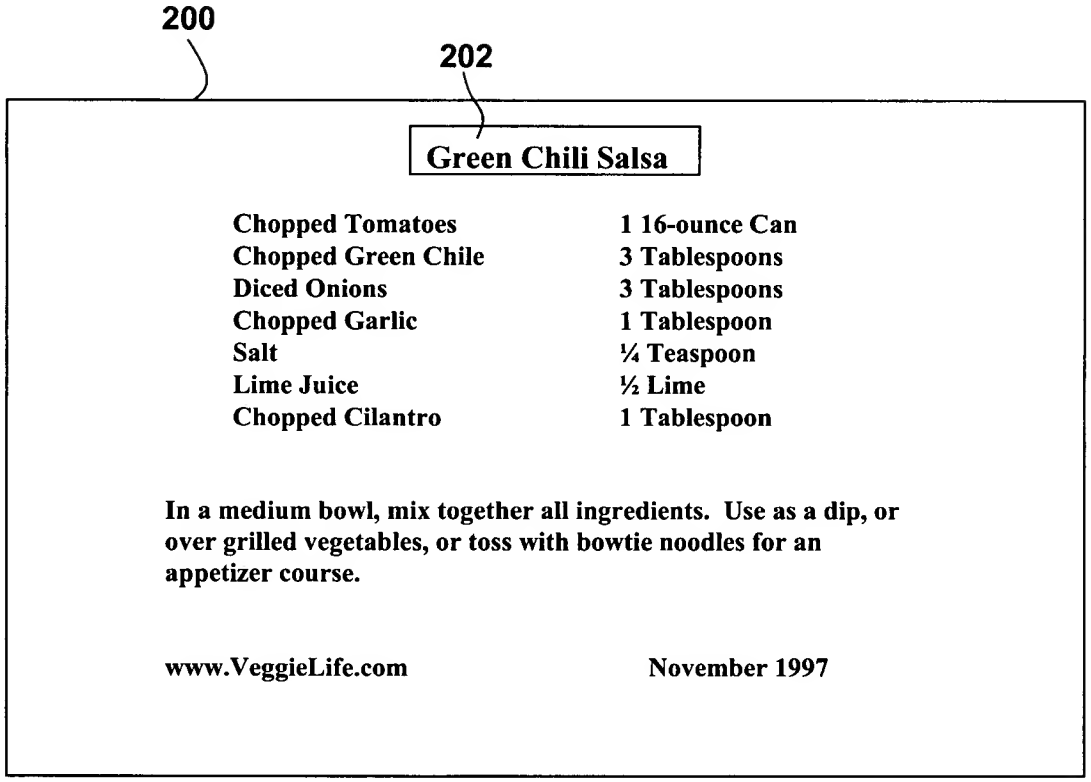

200
202
Green Chili Salsa
Chopped Tomatoes
1 16-ounce Can
Chopped Green Chile
3 Tablespoons
Diced Onions
3 Tablespoons
Chopped Garlic
1 Tablespoon
Salt
¼ Teaspoon
Lime Juice
½ Lime
Chopped Cilantro
1 Tablespoon
In a medium bowl, mix together all ingredients. Use as a dip, or over grilled vegetables, or toss with bowtie noodles for an appetizer course.
www.VeggieLife.com
November 1997

Fig. 2A

208

```
<!-------- Document Type Definition (DTD) --------->
<!-- document element -->
<!ELEMENT document  (recipe+)>

<!------- recipe element ------->
<!ELEMENT recipe (ingredient+, procedure+, presentation, originate)>
<!ATTLIST recipe title CDATA #REQUIRED>

<!------- ingredient element ------->
<!ELEMENT ingredient (#PCDATA)>
<!ATTLIST ingredient amount CDATA #REQUIRED>

<!------- procedure element ------->
<!ELEMENT procedure (#PCDATA)>
<!ATTLIST procedure step CDATA #IMPLIED>

<!------- presentation element ------->
<!ELEMENT presentation (#PCDATA)>

<!------- originate element ------->
<!ELEMENT originate EMPTY>
<!ATTLIST originate name CDATA #REQUIRED>
<!ATTLIST originate website CDATA #IMPLIED>
<!ATTLIST originate date CDATA #REQUIRED>
<!-------- END of DTD --------->
```

210

212

Fig. 2B

```
<document>
 <recipe title="Green Chile Salsa">
  <ingredient amount="1 16-ounce Can">Chopped Tomatoes</ingredient>
  <ingredient amount="3 Tablespoons">Chopped Green Chile</ingredient>
  <ingredient amount="3 Tablespoons">Diced Onions</ingredient>
  <ingredient amount="1 Tablespoon">Chopped Garlic</ingredient>
  <ingredient amount="1/4 Teaspoon">Salt</ingredient>
  <ingredient amount="1/2 Lime">Lime Juice</ingredient>
  <ingredient amount="1 Tablespoon">Chopped Cilantro</ingredient>
  <procedure>In a medium bowl, mix together all ingredients.</procedure>
  <presentation>Use as dip, or over grilled vegetables, or toss with bowtie noodles for an appetizer course.</presentation>
  <originate name="VeggieLife" website="www.VeggieLife.com" date="November 1997" />
 </recipe>
</document>
```

Fig. 2C

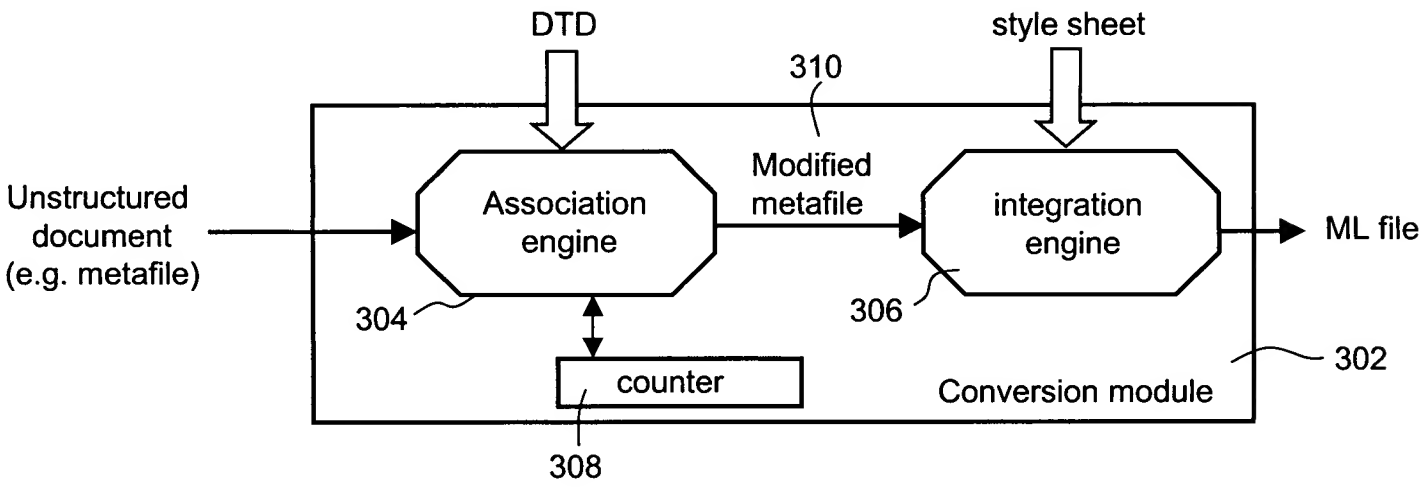
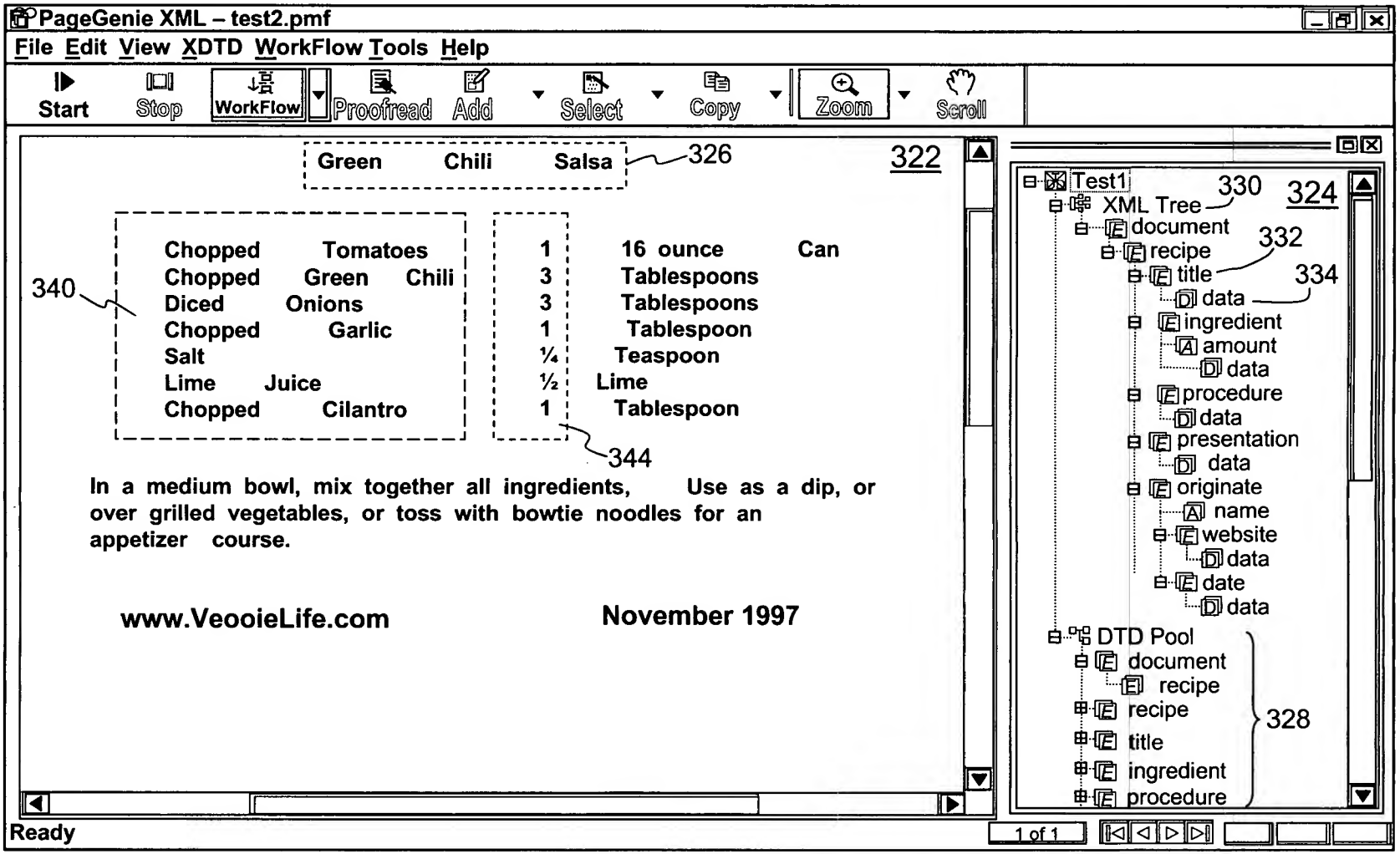

DTD
style sheet
310
Modified
metafile
Unstructured
document
(e.g. metafile)
Association
engine
integration
engine
ML file
304
306
302
counter
Conversion module
308

Fig. 3A

Fig. 3B


320
PageGenie XML – test2.pmf
File Edit View XDTD WorkFlow Tools Help
Start
Stop
WorkFlow
Proofread
Add
Select
Copy
Zoom
Scroll
Green Chili Salsa
326
322
340
Chopped Tomatoes 1 16 ounce Can
Chopped Green Chili 3 Tablespoons
Diced Onions 3 Tablespoons
Chopped Garlic 1 Tablespoon
Salt ¼ Teaspoon
Lime Juice ½ Lime
Chopped Cilantro 1 Tablespoon
344
In a medium bowl, mix together all ingredients, Use as a dip, or over grilled vegetables, or toss with bowtie noodles for an appetizer course.
www.VeooieLife.com
November 1997
Test1
XML Tree
330
324
document
recipe
332
title
334
data
ingredient
amount
data
procedure
data
presentation
data
originate
name
website
data
date
data
342
DTD Pool
document
recipe
recipe
title
ingredient
procedure
328
Ready
1 of 1

```
<?xml version="1.0"?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/TR/WD-xsl">
 <xsl:template match="/" >
  <html>
   <body>
    <xsl:apply-templates />
   </body>
  </html>
 </xsl:template>

 <xsl:template match="document">
  <xsl:apply-templates />
 </xsl:template>

 <xsl:template match="recipe">
  <h2><center><font color="teal">Title: </font><font color="red">
   <xsl:value-of select="title"/>
  </font></center></h2>
  <h3><center><font color="teal">From: </font><font color="gray">
   <xsl:for-each select="originate" >
    <xsl:value-of select="@name" />
   </xsl:for-each>
  </font></center></h3>
  <p><center><table bgcolor="ffffc0" cellspacing="12"><tr><td>
   <xsl:for-each select="image">
   <IMG SRC="recipe.jpg" HEIGHT="200" WIDTH="220"/></xsl:for-each></td><td><table>
    <tr><td><font color="teal" size="5">Ingredient:</font></td></tr>
    <xsl:for-each select="ingredient">
     <tr><td><xsl:value-of select="text()" /></td>
     <td><font color="blue"><xsl:value-of select="amount"/></font></td></tr>
    </xsl:for-each>
  </table></td></tr></table></center></p>

  <p><center><table><tr><td><font color="teal" size="5">Procedure:</font></td></tr>
   <xsl:for-each select="procedure">
    <tr><td><xsl:value-of selec="text()" /> </td></tr>
   </xsl:for-each>
                <tr><td></td></tr>
   <tr><td><font color="teal" size="5">Presentation:</font></td></tr>
   <xsl:for-each select="presentation">
    <tr><td><xsl:value-of selec="text()" /> </td></tr>
   </xsl:for-each>
  </table></center></p>

  <p><center><table bgcolor="c0ffff" width="80%">
   <xsl:for-each select="originate">
    <tr><td align="left"><xsl:value-of select="website" /></td>
    <td align="right"><xsl:value-of select="date"/></td></tr>
   </xsl:for-each>
  </table></center></p>
 </xsl:template>
</xsl:stylesheet>
```

Fig. 3C

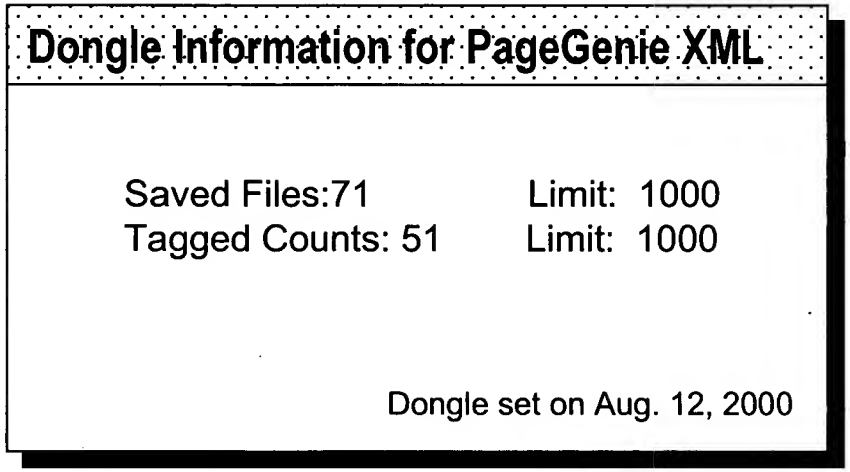

Dongle Information for PageGenie XML
Saved Files:71
Limit: 1000
Tagged Counts: 51
Limit: 1000
Dongle set on Aug. 12, 2000

Fig. 3D

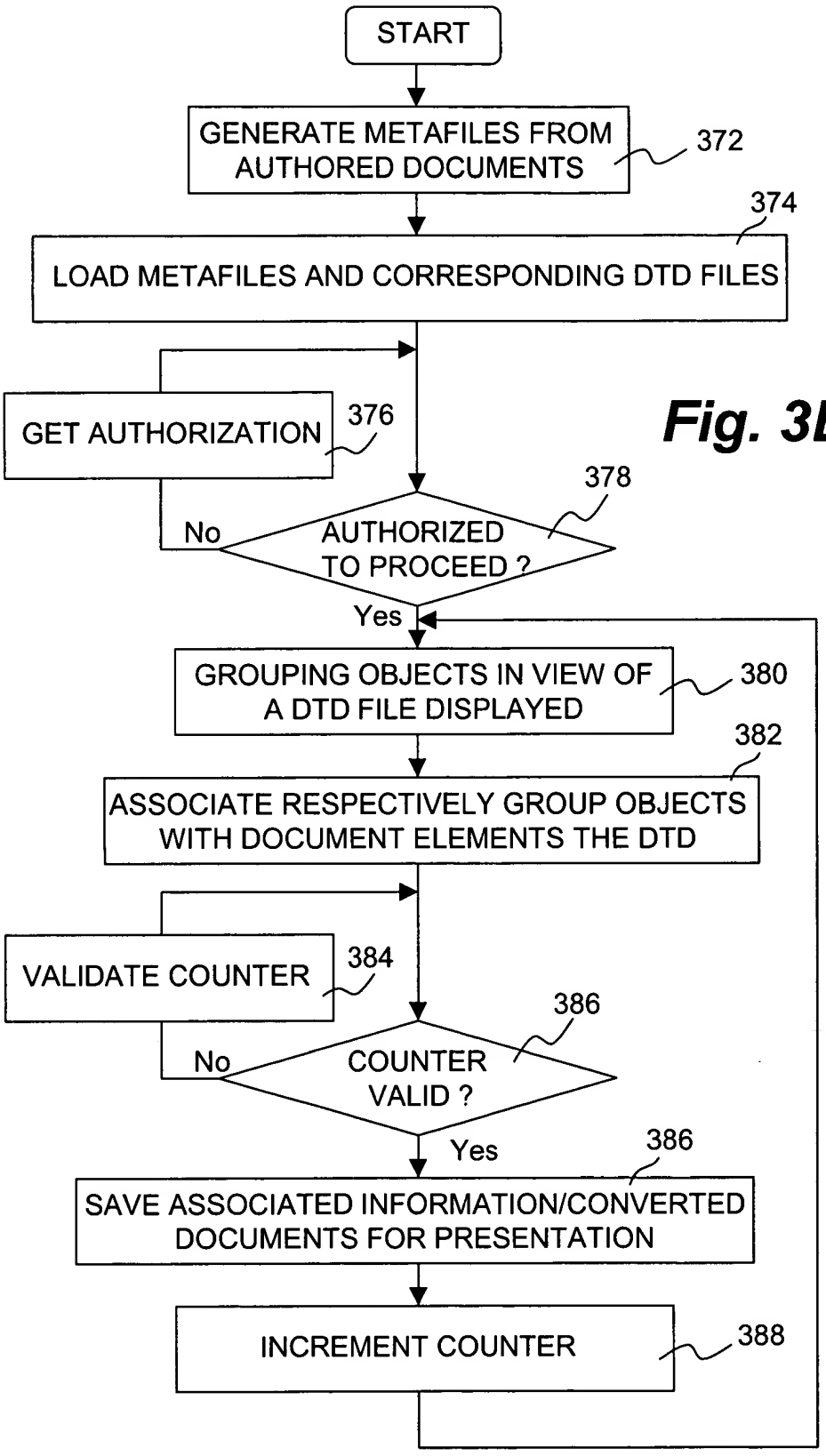

START
GENERATE METAFILES FROM AUTHORED DOCUMENTS
372
374
LOAD METAFILES AND CORRESPONDING DTD FILES
GET AUTHORIZATION
376
378
No
AUTHORIZED TO PROCEED ?
Yes
GROUPING OBJECTS IN VIEW OF A DTD FILE DISPLAYED
380
382
ASSOCIATE RESPECTIVELY GROUP OBJECTS WITH DOCUMENT ELEMENTS THE DTD
VALIDATE COUNTER
384
386
No
COUNTER VALID ?
Yes
386
SAVE ASSOCIATED INFORMATION/CONVERTED DOCUMENTS FOR PRESENTATION
INCREMENT COUNTER
388

Fig. 3E

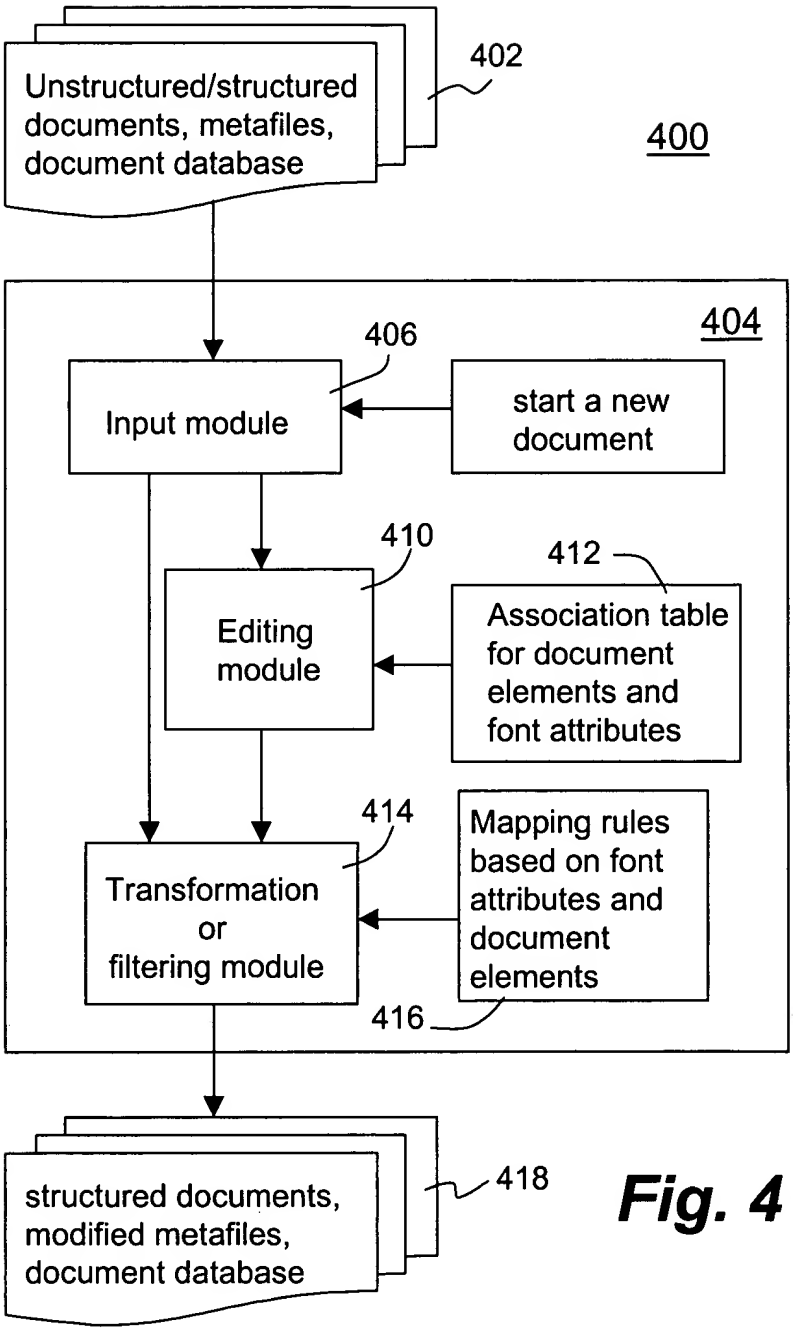

Unstructured/structured documents, metafiles, document database
402
400
404
406
Input module
start a new document
410
Editing module
412
Association table for document elements and font attributes
414
Transformation or filtering module
Mapping rules based on font attributes and document elements
416
structured documents, modified metafiles, document database
418

Fig. 4

500

502 Document Element	504 Element Attribute	506 Font Type	508 Font Style	510 Font Color	512 Font Size	514 Font Effect
recipe	title	Courier New	Bold	Black (0x000000)	12	Underline
ingredient		Courier New	Normal	Magenta (0xFF00FF)	10	Normal
ingredient	amount	Courier New	Italic	Red (0x0000FF)	10	Normal
procedure		Arial	Italic	Blue (0xFF0000)	10	Normal
presentation		Arial	Normal	Cyan (0xFFFF00)	10	Normal
originate	name	Times New Roman	Bold	Green (0x00FF00)	10	Normal
originate	website	Times New Roman	Bold + Italic	Yellow (0x00FFFF)	10	Normal
originate	date	Times New Roman	Normal	Gray (0x808080)	10	Normal

Fig. 5

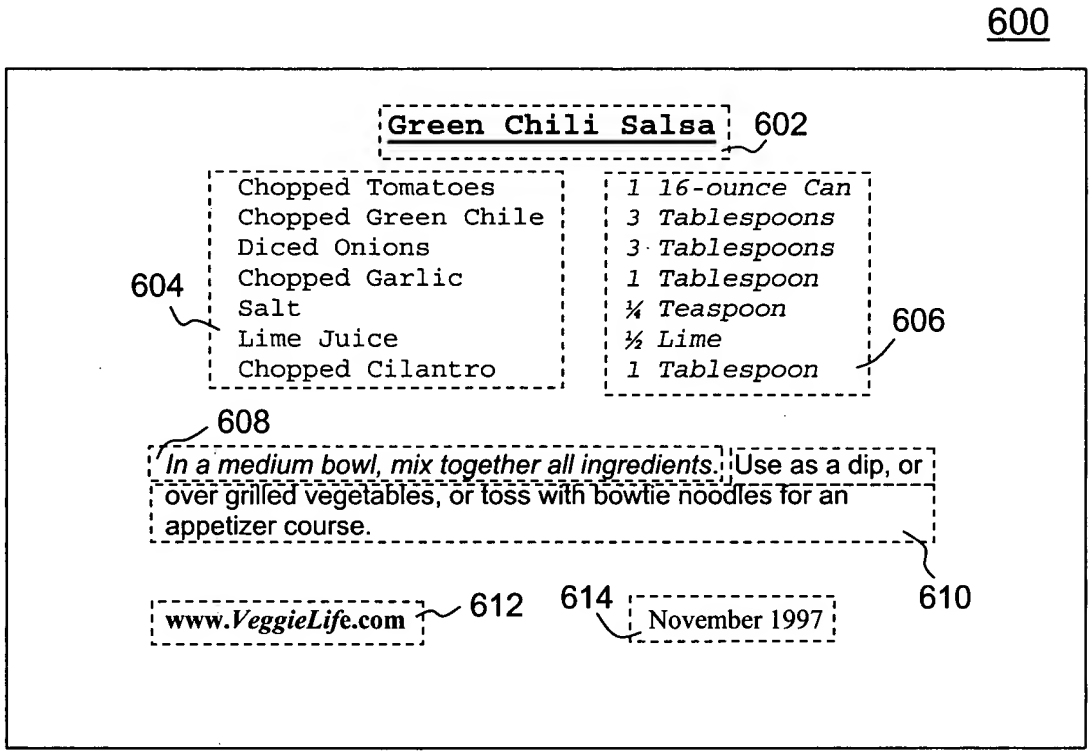

600
Green Chili Salsa
602
Chopped Tomatoes
Chopped Green Chile
Diced Onions
Chopped Garlic
Salt
Lime Juice
Chopped Cilantro
604
1 16-ounce Can
3 Tablespoons
3 Tablespoons
1 Tablespoon
¼ Teaspoon
½ Lime
1 Tablespoon
606
608
In a medium bowl, mix together all ingredients. Use as a dip, or over grilled vegetables, or toss with bowtie noodles for an appetizer course.
610
www.VeggieLife.com
612
614
November 1997

Fig. 6

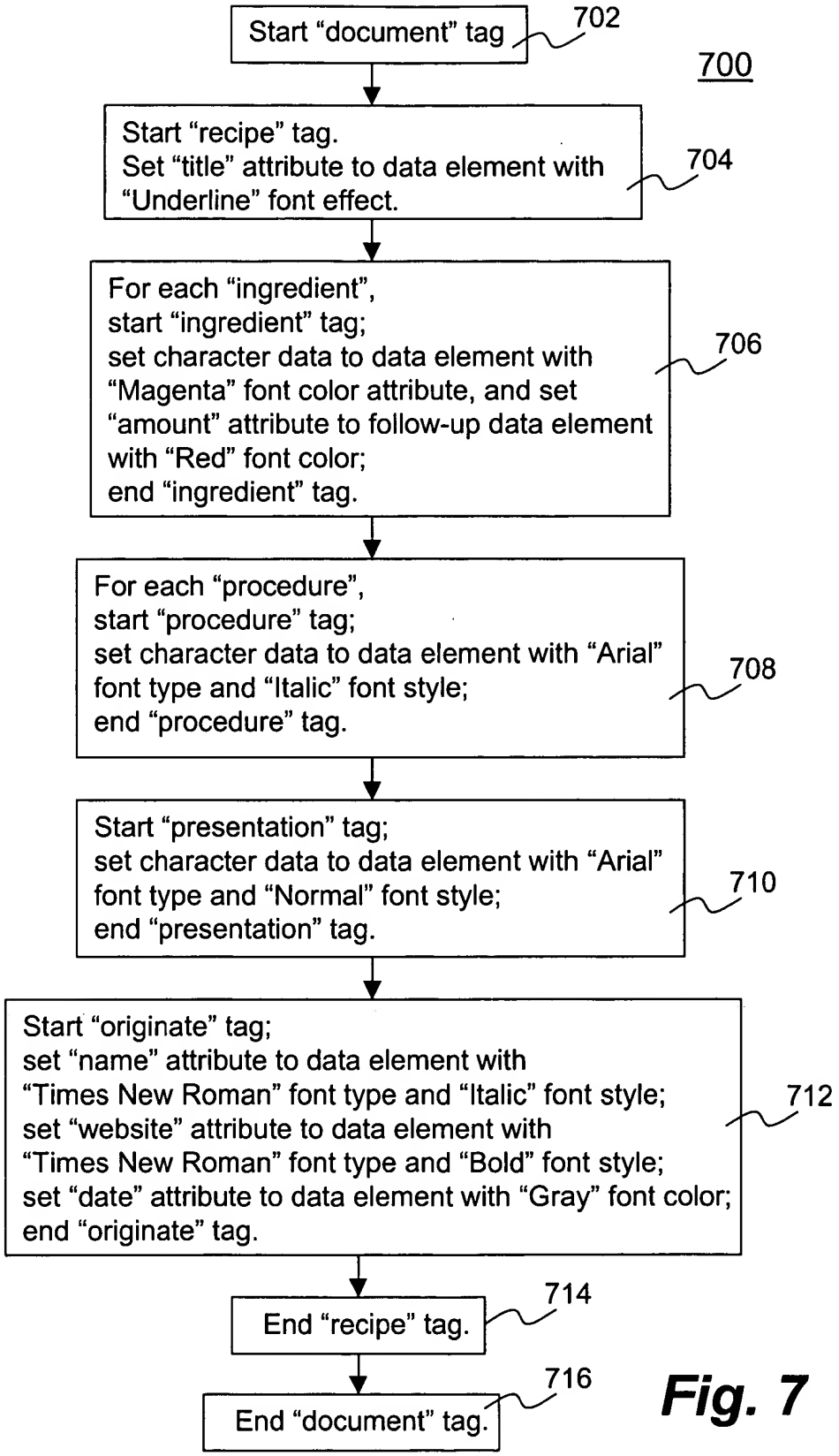

Start "document" tag
702
700
Start "recipe" tag.
Set "title" attribute to data element with "Underline" font effect.
704
For each "ingredient",
start "ingredient" tag;
set character data to data element with "Magenta" font color attribute, and set "amount" attribute to follow-up data element with "Red" font color;
end "ingredient" tag.
706
For each "procedure",
start "procedure" tag;
set character data to data element with "Arial" font type and "Italic" font style;
end "procedure" tag.
708
Start "presentation" tag;
set character data to data element with "Arial" font type and "Normal" font style;
end "presentation" tag.
710
Start "originate" tag;
set "name" attribute to data element with "Times New Roman" font type and "Italic" font style;
set "website" attribute to data element with "Times New Roman" font type and "Bold" font style;
set "date" attribute to data element with "Gray" font color;
end "originate" tag.
712
End "recipe" tag.
714
End "document" tag.
716

Fig. 7

```
<document>
<font font_ID="1" type="Courier New" style="Bold" color="0x000000" size="12" effect="Underline" />
<font font_ID="2" type="Courier New" style="Normal" color="0xFF00FF" size="10" effect="Normal" />
<font font_ID="3" type="Courier New" style="Italic" color="0x0000FF" size="10" effect="Normal" />
<font font_ID="4" type="Arial" style="Italic" color="0xFF0000" size="10" effect="Normal" />
<font font_ID="5" type="Arial" style="Normal" color="0xFFFF00" size="10" effect="Normal" />
<font font_ID="6" type="Times New Roman" style="Bold" color="0x00FF00" size="10" effect="Normal" />
<font font_ID="7" type="Times New Roman" style="Bold Italic" color="0x00FFFF" size="10" effect="Normal" />
<font font_ID="8" type="Times New Roman" style="Normal" color="0x808080" size="10" effect="Normal" />
```

802

Fig. 8

```
<data font_ID="1">Green Chili Salsa</data>
<data font_ID="2">Chopped Tomatoes</data>
<data font_ID="3">1 16-ounce Can</data>
<data font_ID="2">Chopped Green Chile</data>
<data font_ID="3">3 Tablespoons</data>
<data font_ID="2">Diced Onions</data>
<data font_ID="3">3 Tablespoons</data>
<data font_ID="2">Chopped Garlic</data>
<data font_ID="3">1 Tablespoon</data>
<data font_ID="2">Salt</data>
<data font_ID="3">¼ Teaspoon</data>
<data font_ID="2">Lime Juice</data>
<data font_ID="3">½ Lime</data>
<data font_ID="2">Chopped Cilantro</data>
<data font_ID="3">1 Tablespoon</data>
<data font_ID="4">In a medium bowl, mix together all ingredients.</data>
<data font_ID="5">Use as a dip, or over grilled vegetables, or toss with bowtie noodles for an appetizer course.</data>
<data font_ID="6">www.</data>
<data font_ID="7">VeggieLife</data>
<data font_ID="6">.com</data>
<data font_ID="8">November 1997</data>
</document>
```

804

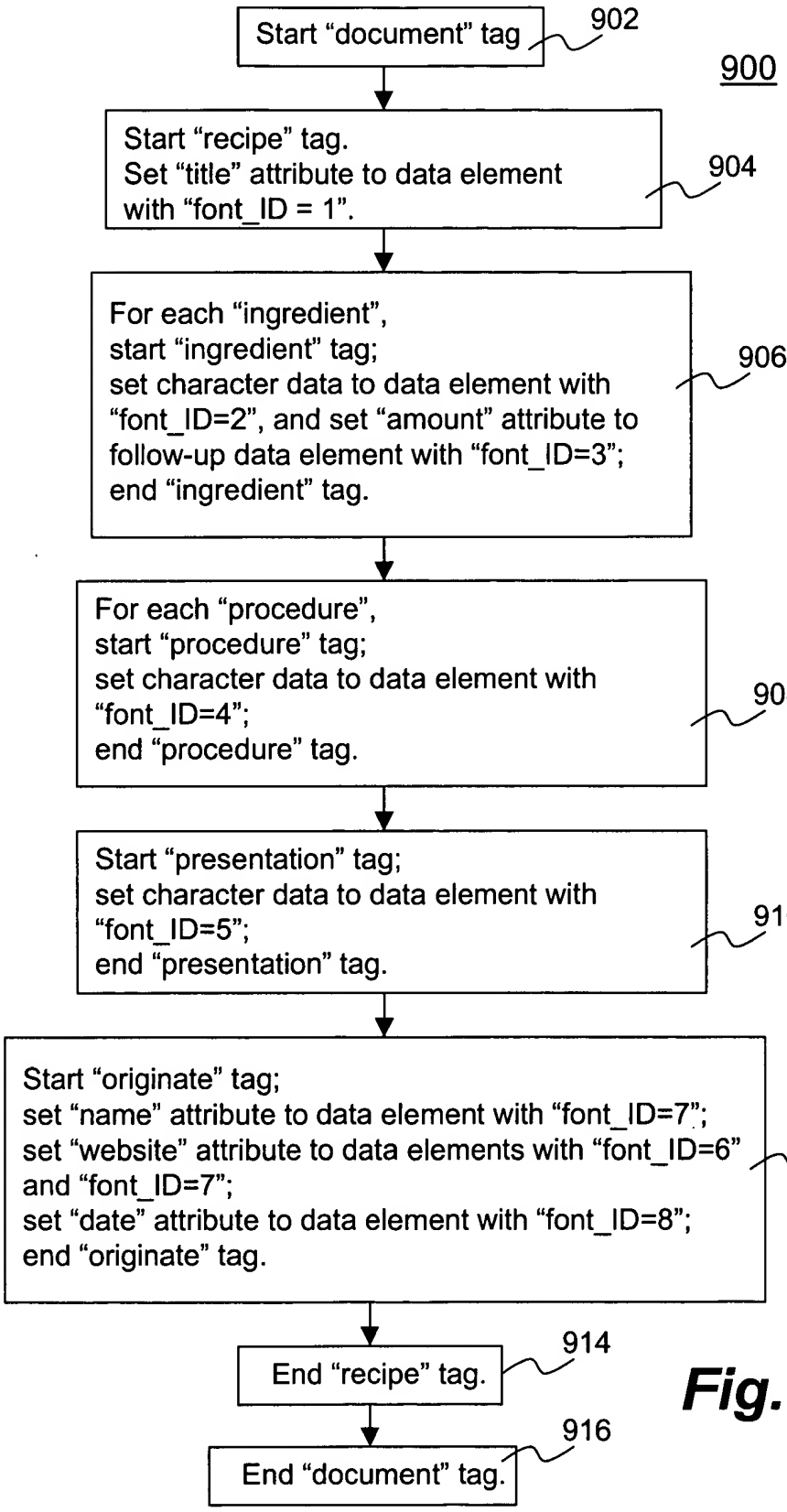

Start "document" tag
902
900
Start "recipe" tag.
Set "title" attribute to data element with "font_ID = 1".
904
For each "ingredient", start "ingredient" tag; set character data to data element with "font_ID=2", and set "amount" attribute to follow-up data element with "font_ID=3"; end "ingredient" tag.
906
For each "procedure", start "procedure" tag; set character data to data element with "font_ID=4"; end "procedure" tag.
908
Start "presentation" tag; set character data to data element with "font_ID=5"; end "presentation" tag.
910
Start "originate" tag; set "name" attribute to data element with "font_ID=7"; set "website" attribute to data elements with "font_ID=6" and "font_ID=7"; set "date" attribute to data element with "font_ID=8"; end "originate" tag.
912
End "recipe" tag.
914
End "document" tag.
916

Fig. 9

```
<?xml version="1.0" standalone="yes"?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
 <xsl:template match="/">
  <document>
   <xsl:apply-templates/>
  </document>
 </xsl:template>
 <xsl:template match="document">
  <recipe title="{data[@font_ID='1']}">
   <xsl:for-each select="data[@font_ID='2']">
    <ingredient amount="{following-sibling::data[@font_ID='3']}">
    <xsl:value-of select="."/>
    </ingredient>
   </xsl:for-each>
   <xsl:for-each select="data[@font_ID='4']">
    <procedure step="{position()}">
    <xsl:value-of select="."/>
    </procedure>
   </xsl:for-each>
   <presentation>
    <xsl:value-of select="data[@font_ID='5']" />
   </presentation>
   <xsl:for-each select="data[@font_ID='7']">
    <originate name="{.}" website="{preceding-sibling::data[@font_ID='6']}{.}{following-
        sibling::data[attribute::font_ID='6']}" date="{following-sibling::data[@font_ID='8']}" />
   </xsl:for-each>
  </recipe>
 </xsl:template>
</xsl:stylesheet>
```

1000

Fig. 10